

A new species of wagtail from the lower Mekong basin

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On 13 December 1972, Kitti Thonglongya collected two black-and-white wagtails from Ubon Ratchathani Province, Thailand, now held in the Thailand Institute of Scientific and Technological Research, Bangkok, Thailand (TISTR). These formed the basis for Lekagul & Round's (1991) illustration of '*Motacilla alba alboides*'. Wagtails broadly fitting this picture of '*M. a. alboides*' were found locally in south Laos in February 1993, but generated minimal interest because they (apparently) fitted a recognised taxon, as portrayed in an excellent field guide. Intensive bird surveys across Laos up to 2000 (Duckworth 1996, Thewlis *et al.* 1996, 1998, Davidson *et al.* 1997, Evans & Timmins 1998, Duckworth *et al.* 1998a, 1999, in press, Round 1998, Showler *et al.* 1998, Evans *et al.* 2000, Evans in press, WCS Lao Program unpublished data) recorded the same wagtail only in the south of the country. In 1997, these wagtails were suspected to breed in far southern Laos. This would be a major extension of known range; *M. a. alboides*, from the Himalayas and central China, breeds no closer than northern Vietnam (Vaurie *et al.* 1960) and north Laos (Duckworth *et al.* 1998a, 1999; R. J. Tizard *in litt.* 2001). The first intensive bird survey of riverine habitat in Cambodia, in 1998, found this wagtail ('*M. a. alboides*') breeding widely across the Mekong tributaries of the north-east of the country (Timmins & Men Soriyun 1998). In February 1999, F. Goes, N. J. van Zalinge & CMP travelled fresh parts of the north-east, and again found it breeding widely, as did N. J. van Zalinge, JWD & CMP in February 2000. Robson's (2000) field guide to South-east Asian birds illustrates accurately *M. a. alboides*, and shows it to be a very different bird from the breeding wagtail of southern Indochina. Examination of specimens of all possible confusion taxa in TISTR, the Natural History Museum, Tring, UK (BMNH), and the American Museum of Natural History, New York, USA (AMNH) during 2000 confirmed the distinctness of what we previously thought to be '*M. a. alboides*'.

On 9–16 February 2001, PA, JWD, PD, CMP & TS visited the Mekong, San and Kong rivers in the vicinity (upstream) of Stung Treng, Stung Treng Province, northeast Cambodia, observed well over 100 individuals of the unknown wagtail in adult and second calendar-year plumages, and collected 3 adult males, 3 adult females and 2 first-adult (second calendar-year) females (see Appendix 1). Juveniles were observed and photographed around Kampi, Kratie province, on 14–15 April 2001 by PD. Collected birds were kept in alcohol until they were prepared as specimens; one remains in alcohol. Six specimens were prepared with the right wing detached and spread, so that details of the wings can be more easily studied. PA compared 6 of these specimens, plus photographs of the other two, directly with specimens of possible confusion

taxa, in particular African Pied Wagtail *Motacilla a. aguimp* (4 on loan from BMNH) and *M. aguimp vidua* (11 on loan from BMNH; 11 in the Swedish Museum of Natural History, Stockholm, Sweden [NRM]; and one in the Museum of Evolution, Uppsala University, Uppsala, Sweden), having previously studied large series of all possible confusion taxa in e.g. BMNH and AMNH. JWD and TDE compared specimens of the unknown wagtail with large series of specimens of possible confusion taxa in BMNH. The following measurements were taken on all individuals caught: wing length (maximum chord) and tail length (ruler inserted under the undertail-coverts) to the nearest 0.5 mm; bill length (to skull), tarsus length (to the last complete scutum before the toes), and hind-claw length (to the thin skin at the base) to the nearest 0.1 mm. Wing formula was described with primaries (P) numbered descendantly and secondaries (S) numbered ascendantly. Total length (bill tip to tail tip) was measured to the nearest mm on 4 specimens by placing the specimens on their backs on a ruler. All measurements were taken by PA on the day of collection, except total length, which was taken by Anders Hansson just before the specimens were prepared. In the description, rectrix is abbreviated R, and the rectrices are numbered from inner to outer; greater covert is abbreviated GC, and they are numbered ascendantly.

In addition to the birds caught, 10 were filmed using a Sony DCR-TR7100E camcorder through a Swarovski AT 80 HD telescope, and 4 were photographed. The video footage and photographs were compared with photographs of possible confusion taxa, in particular *M. aguimp vidua* (n=15).

Songs and calls of many birds were heard, and songs of at least 12 males and calls of c. 20 individuals were tape-recorded using a Sony DAT recorder TCD-D8 and a Telinga Pro parabolic reflector/microphone. Sonograms were made of 'simple' songs from 10 individuals, 'complex' songs from 4 individuals, and calls from 13 individuals, using the software Canary 1.2.4 (Mitchell *et al.* 1995). The tape recordings and sonograms were compared with possible confusion taxa, in particular *M. aguimp vidua* (n=11) assembled from various sources.

In the following text, topography, age, moult and voice terminology follow Alström *et al.* (in press). *First-adult* refers to the immature plumage obtained through the post-juvenile moult when there is no pre-breeding moult (and accordingly no difference between first-winter and first-summer); *first-‘winter’* and *first-‘summer’* are used for *M. aguimp* to indicate that these plumages are not so strongly related to the seasons as in Eurasian wagtails; *first-year* refers collectively to juvenile, first-‘winter’ and first-‘summer’, or juvenile and first-adult. In the voice descriptions, an *element* is a discrete, unbroken unit in a sonogram; a *note* is a discrete sound which, however, does not necessarily consist of a single element; a *phrase* refers to a series of two or more different notes that is given twice (rarely more times) in succession; a *rattle* is a multiple, fast repetition of either a single very short element or a phrase of very short elements; and a *strophe* is an uninterrupted series of notes that is separated from other strophes by silent *pauses*.

Original descriptions and/or type specimens of most of the available names listed in Sharpe (1885) and all those in Vaurie *et al.* (1960) were studied, and literature was searched for taxa described subsequently.

The south Indochinese wagtail (Plate 1, 2) is a distinctive, hitherto unnamed, taxon, for which we propose the name:

Mekong Wagtail *Motacilla samveasnae* sp. nov.

Holotype

The Natural History Museum, Tring, UK, BMNH reg. no. 2001.8.1, field no. JWDKH09, adult male, San river ('Se San channel' on original label), Stung Treng province, Cambodia, 13°32'28"N, 106°04'12"E, c. 50 m a.s.l., 13 February 2001. Collected by PA and JWD, prepared by Anders Hansson (Plate 2).

Diagnosis

Adult and first-adult: Plumage lacks green or yellow. Distinguished from White-browed Wagtail *Motacilla maderaspatensis* by all-white throat and white patch on side of neck. Told from all taxa in the White Wagtail *M. alba* complex by blackish central stripe on the forehead (extending to the base of the bill, and including the bases of the feathers) and all-blackish ear-coverts, from all except *M. a. subpersonata*, *M. a. ocularis* and *M. a. lugens* also by blackish lores, and from *M. a. alboides* and *M. a. personata* also by white sides of neck. Told from Japanese Wagtail *M. grandis* by all-white throat, white patch on side of neck and blackish central stripe on the forehead. Further separated from *M. maderaspatensis*, many *M. grandis* and all taxa in the *M. alba* complex (except some first-year *lugens*) by, from above, dark remiges with all-white bases to the outer and inner webs of the secondaries and inner primaries, forming a white bar (most pronounced on inner primaries in first-adult female). Closely resembles African Pied Wagtail *M. a. aguimp* and *M. aguimp vidua*; most safely distinguished by the pattern of the remiges, in particular the more extensive white outer edges to P1–P5 (see below).

Juvenile: Plumage mostly brownish-grey and white. Differs from *M. maderaspatensis*, *M. grandis*, *M. alba* ssp. and *M. aguimp* by combination of pale throat with dark malar stripes, dark ear-coverts and a dark loreal stripe (can be restricted to proximal lores), and rather extensively dark-centred median and greater coverts.

Description of holotype

Plumage: Forehead (to base of bill, and including basal parts of feathers), crown and nape blackish (very faint brown tinge to central and rear crown and nape). Long, broad white supercilium from base of bill to slightly beyond rear of ear-coverts; supercilium so broad that blackish on forehead reduced to narrow stripe, hardly visible from side view, even in the hand. Lores show tapering, 'triangular' blackish stripe. Ear-coverts blackish, with thin white crescent (broken eye-ring) below eye. Broad blackish, slightly U-shaped, breast-band, which reaches onto lower part of otherwise white throat; border between blackish and white on throat slightly mottled and not clear-cut. Breast-band connected by broad blackish 'spur' to lower rear end of ear-coverts and by thinner blackish 'spur' to junction of nape/mantle/scapulars, thereby isolating prominent white patch on sides of neck. Colour of crown and nape



Plate 1. *Motacilla samveasnae*. (a, c, e) different adult (?) males; (b, d) different adult females, the one in b paired to the male in a; (f) juvenile. The white patch on the side of the neck appears unusually large in e. (a–e) from Stung Treng Province, Cambodia, mid-February 2001, (f) from Kratie province, Cambodia, mid-April 2001. Photographs: Pete Davidson (a, b, f) and Per Alström (c, d, e; from video).

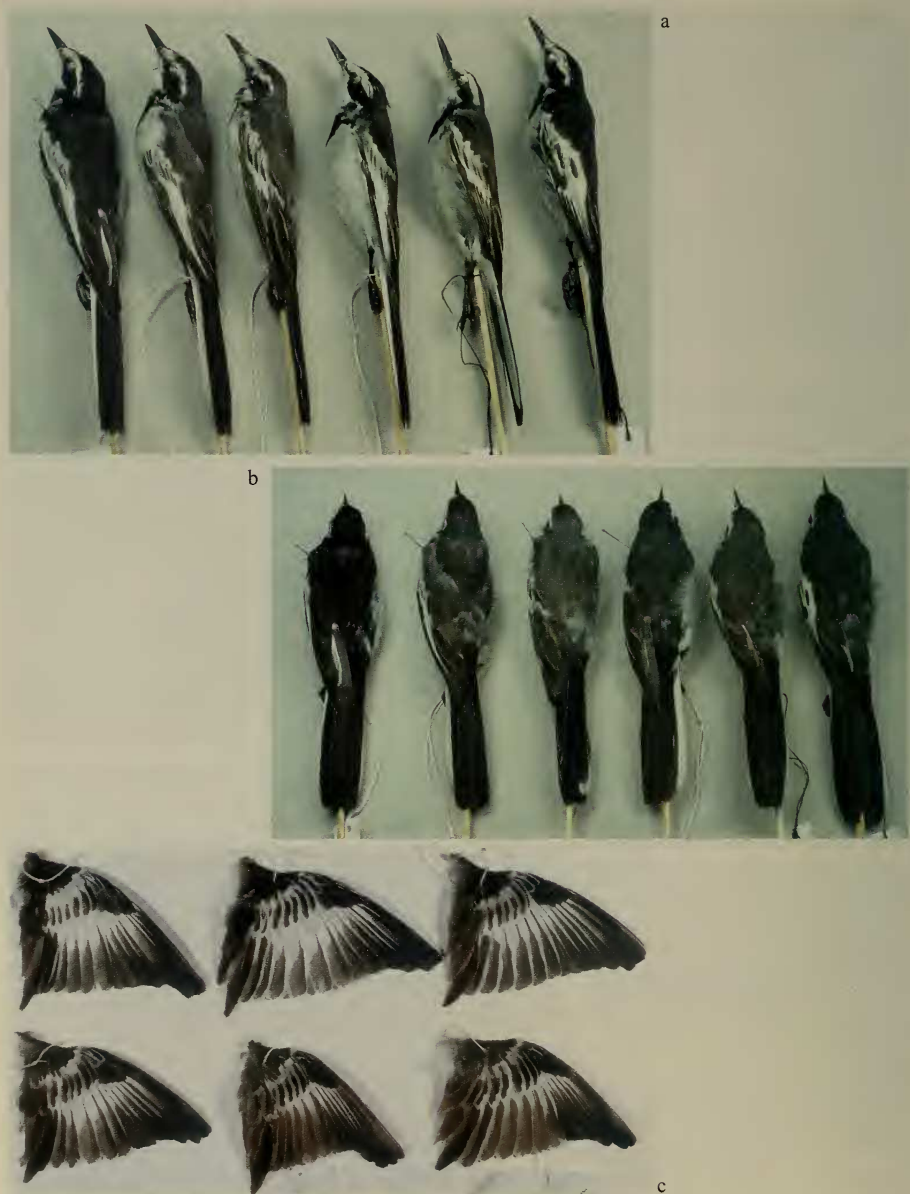


Plate 2. Six of the specimens in the type series. (a, b) from left to right: Adult male BMNH 2001.8.1 (holotype), adult female BMNH 2001.8.3, first-adult female NRM 20016100, adult female BMNH 2001.8.2, first-adult female BMNH 2001.8.4 and adult male BMNH 2001.8.5. (c) top row: BMNH 2001.8.5, BMNH 2001.8.1, BMNH 2001.8.2; bottom row: BMNH 2001.8.3, BMNH 2001.8.4, NRM 20016100. Photographs: Göran Frisk (a, b) and Lars-Erik Jönsson (c).

merges with blackish-brown mantle and scapulars. Back, rump and proximal median uppertail-coverts similar to mantle, although slightly tinged greyish. Proximal lateral uppertail-coverts blackish with broad whitish outer edges and greyish-white inner edges. Distal lateral uppertail-coverts tinged more brownish. Breast below blackish breast-band, flanks, belly and undertail-coverts white, slightly tinged greyish (especially on flanks, but here largely concealed by folded wings).

Lesser coverts blackish with brown tinge. Median coverts: outers mainly white with brownish-tinged blackish bases; progressively more extensively blackish, especially on inner webs, towards body; innermost feather mainly blackish with white tip and edges, broadest on outer web. GC1 blackish-brown with *c.* 2 mm white tip to outer and inner webs, *c.* 1 mm white edge to outer web, and white edge to inner web *c.* 1 mm wide distally and *c.* 2.5 mm wide basally; GC2–GC7 show progressively more white on inner (except on GC6–GC7) and especially outer webs, outer web being mainly white with only indistinct grey-brown smudges on GC6–GC7; GC8–GC10 largely blackish-brown (presumably with quite broad white edge to outer web of GC8 when fresh, but now almost completely worn off) (Plate 2). Tertials blackish-brown, with very indistinct, narrow paler edges; longest tertial has white basally on outer web (concealed by greater coverts). Primary coverts blackish with brown tinge, with narrow whitish edges basally to outer webs, and prominent whitish patches basally on inner webs (extending more than halfway towards tips). Alula feathers blackish, with progressively broader white fringes from largest to smallest feather. Carpal covert blackish with *c.* 1 mm white fringe. P1 white basally with dark brown shaft and *c.* 25 mm-long brown-tinged blackish distal portion, latter with progressively narrower white edges to both webs (extending very narrowly to tip of feather on outer web and to *c.* 18 mm from tip of feather on inner web). P2–P4 show slightly shorter white outer and inner edges and progressively more extensive dark distal portions; on P5–P8 dark distal portion extends narrowly along shaft to base on inner web, and white base to outer web and edge to the same progressively become less extensive (white base entirely covered by primary coverts on P7–P8); P9 dark on outer web with very narrow white edge throughout length (widest at base); P10 (minute) all white. S1 white basally with brown-tinged blackish shaft and *c.* 28 mm long distal portion; broad white edge to outer web, progressively narrower towards tip and very narrowly surrounds tip and narrowly reaches up on inner web (broadens towards base). S2–S4 show progressively more white basally and on edges and tips, whereas amount of white on S5–S6 decreases progressively. White bases to remiges form a broad white band on upperwing when spread, broadest on central–outer secondaries and inner primaries (Plate 2). On the folded wing, the white outer edges to the secondaries form a uniform white bar along the wing (while the white outer edges to the inner primaries are concealed) (Plate 2). Underwing-coverts white with mainly concealed grey bases to the primary and secondary coverts; underwing looks largely white with dark tips to the remiges. R1–R4 blackish with a faint brown tinge (left R4 shows a thin white stripe, *c.* 7 mm long, basally on inner web). R5–R6 white (including shaft) with blackish base to outer web and extensively blackish along edge of inner web. Feathers on tibia whitish with blackish centres.

Condition of plumage: Most of plumage worn, especially median coverts, inner greater coverts, tertials and rectrices. A few scattered feathers on the forehead, crown (mainly sides) and nape have been renewed later than the rest of the plumage. Due to wear, it is not possible to judge e.g. how broad the pale edges to the tertials and inner greater coverts were when they were fresh; whether the primary coverts had distinct pale edges along their entire lengths when they were fresh; or to what extent the brown tinge above is the result of wear and bleaching. The colour contrast between the forehead and sides of the crown, on the one hand, and the mantle, on the other hand, may be due to the fact that the former parts have fresher feathers than the latter parts. The distal uppertail-coverts are browner than the proximal uppertail-coverts, presumably because the former are generally more exposed than the latter. It seems likely that most of the dark feathers were at least marginally blacker when fresh, as is generally the case in wagtails (Alström *et al.* in press).

Bare parts: Bill black. Iris dark brown. Very thin orbital ring dark grey. Tarsus, toes and claws greyish-black; soles rather pale grey with faint buffish tinge.

Measurements: Total length 175; wing 86.5; tail 78.0; bill 19.3; tarsus 20.7; hind claw 6.4. Wing formula: WP=P7–P8, P9–2, P6–1.5, P5–8, P4–14, P3–18, P2–21, P1–23; emarginations to P6–P8; lacks distinct notches.

Paratypes

Plumage: All 7 paratypes (see Appendix 1), except adult male AMNH skin 833352, were directly compared with the holotype. Adult male AMNH skin 833352 and adult female BMNH A/2001.6.1 were not directly compared with each other, nor with any other paratype, although colour photographs taken at collection were compared with the rest of the type series. Accordingly, exact differences in colour hues between these two specimens and the others are unclear.

Adult male BMNH 2001.8.5 is slightly paler and browner above than the holotype (Plate 2), and judging from photographs and field notes, adult male AMNH skin 833352 seems to be even marginally paler (mantle and scapulars described as dark greyish-brown in the field). The four females compared directly resemble each other in the colouration above (Plate 2), as apparently (from photographs and field notes) does adult female BMNH A/2001.6.1. Females are clearly paler and greyer on the upperparts than the males, with more contrast between the grey-brown mantle/scapulars and blackish ear-coverts and forehead/crown (at least anterior parts and sides of crown blackish) (Plates 2). In females, newly moulted feathers on the upperparts (see below) are greyer, less brown-tinged, than worn feathers.

The width of the blackish breast-band varies individually (Plate 2). The holotype has the most black. On most individuals it extends onto the lowermost part of the throat, but at least in BMNH 2001.8.4 the entire throat is white.

The wing pattern varies individually, with age, and to a lesser extent sex (Plate 2). Lesser coverts are blackish with a brown tinge in both males (as in the holotype), but they are slightly paler and tinged more grey-brown in the females. The centrally placed median coverts of BMNH 2001.8.5 show less dark on the inner webs (reduced

to an isolated dusky spot) than on any other specimen, which are all rather similar to each other and to the holotype. In adult male AMNH skin 833352, GC3–GC7 show more white, especially on the outer webs (all-white outer web on GC 6). Adult male BMNH 2001.8.5 shows even more white on the greater coverts than AMNH skin 833352 (e.g., GC5–GC7 have all-white outer webs). Pattern of the greater coverts varies only slightly in the females. They show less white basally on the outer webs, especially, and inner webs than the males. All except one have extensively dark outer webs to GC1–GC7, with just a little whitish basally (well concealed by the median coverts); in BMNH A/2001.6.1, GC6 is nearly all white on the outer web, with an indistinct dusky smudge.

The patterns of the alula feathers, carpal covert and primary coverts are rather similar in all adults. The two first-adult females, however, have narrower and less distinct whitish tips and outer edges to the smallest and central alula feathers, BMNH 2001.8.4 also to the carpal covert. In contrast to the adults, the two first-adult females lack a distinct whitish edge to the inner web of the central alula feather, BMNH 2001.8.4 also lacks a distinct whitish edge to the inner web of the carpal covert. The primary coverts of the two first-adult females are browner, more worn, more pointed and have more frayed tips than in the adults, and they lack the adults' very thin whitish edges to the bases of the outer webs of the outer feathers and their distinct whitish patch along the edge basally of the inner webs.

Compared with the holotype, adult male BMNH 2001.8.5 shows longer and broader white outer edge to P9; all-white outer web basally to P8 (equal to tip of longest primary covert); all-white outer web basally to P7 (reaching 2 mm beyond tip of longest primary covert); and white outer web basally to P6 reaches 3 mm beyond tip of longest primary covert. Adult female BMNH 2001.8.2 and adult male AMNH skin 833352 resemble the holotype on P6–P9, whereas adult female BMNH 2001.8.3 and the two first-adult females lack white on the outer web of P6 beyond the tip of the corresponding primary covert. The two first-adult females also show marginally less white on the outer webs of P1–P5, compared with the holotype and the other adults.

The pattern of the secondaries is basically similar in all adults, although in no paratype are the white edges to the distal portion of the inner webs quite so distinct as in the holotype. AMNH skin 833352, BMNH 2001.8.3 and BMNH 2001.8.5 have slightly narrower white outer edges to the secondaries than the holotype and the other two adult paratypes, possibly because of greater wearing. In both first-adult females, the dark on the outer webs of the secondaries is so extensive that very little or no white is visible on the bases of the outer webs beyond the tips of the greater coverts, resulting in less distinct white bar on the upper surface of the secondaries on the spread wing than in adults (Plate 2). Moreover, the whitish edges and tips to the outer webs are narrow and indistinct in the two first-adults (except on two newer feathers in NRM 20016100), giving the impression of mainly dark secondaries on the folded wing in the first-adult females, unlike in all of the adults, in which they form a white bar (Plate 2). On the inner webs, the extent of white is rather similar in the first-adults and the adults, although the dark distal portions have insignificant whitish tips and edges in the first-adults.

Bare parts: No variation noted.

Measurements: See Tables 1 and 2 for summaries.

Etymology

The specific name honours the late Sam Veasna (pronounced 'Sam Veeshna'), one of Cambodia's leading ornithologists and conservationists, who died, tragically young, on 3 December 1999 of malaria, contracted during fieldwork in northern Cambodia. The English name indicates that it is the only wagtail breeding in the lower Mekong catchment, to which on current knowledge it is restricted. Moreover, it draws attention to the major, yet desperately fragile, geographic feature of this bird's very restricted range.

Sexing, ageing and moult

Sexing

All specimens were sexed tentatively, based on colouration of upperparts, behaviour immediately prior to capture, and cloacal protuberance/brood patch. Sex was later confirmed internally (except, yet, for AMNH skin 833352 and BMNH A/2001.6.1).

Females are distinctly paler and greyer on the crown, nape, mantle, scapulars, back, rump and lesser coverts than males, and show more pronounced contrast between these parts and the blackish lores, ear-coverts and breast-band than males (Plates 1–2). Sexing was possible in the field, often even when birds were seen singly, but plumage differences are slight and experience is needed to use them. Moreover, there may be some overlap in the colouration of the upperparts, especially between first-adult male and adult female, as is the case in other black-and-white wagtails (Alström *et al.* in press). In our specimens, females are more extensively dark on the greater coverts than males, but we suspect that a larger sample would reveal considerable overlap between the sexes in this respect.

Males are larger than females (Table 1), the sample showing no overlap. Males showed a prominent cloacal protuberance, but no trace of a brood patch, while females showed less of a cloacal protuberance and a more swollen abdomen next to the cloaca; two birds (BMNH 2001.8.3 and 2001.8.2) had begun to develop a brood patch. Only birds matching males in upperparts colouration were definitely heard singing 'simple' song; the only possible record of a female in song concerned a bird giving 'complex' song once, that appeared to match a female in colour above; seen under poor conditions, it may in fact have been a first-adult male.

Ageing

Juvenile plumage (Plate 1) is easily distinguished from subsequent plumages by the relatively pale brownish-grey upperparts, less distinct head pattern, and diffuse dark grey or brownish-grey patch on the central breast. The median and greater coverts show more extensive dark centres and more diffuse off-white or buffish outer edges than in adult (but detailed pattern unknown).

TABLE 1

Measurements of *M. samveasnae* and *M. aguimp*. Numbers in brackets refer to, in sequence, mean, standard deviation and sample size.

<i>M. samveasnae</i>		
	Male	Female
Wing	86.5–87.0 (86.7; 0.29; 3)	80.0–83.0 (81.4; 1.19; 5)
Tail	78.0–81.5 (79.5; 1.80; 3)	75.0–78.0 (76.6; 1.25; 4)
Bill	19.2–19.6 (19.4; 0.21; 3)	19.0–19.2 (19.1; 0.08; 5)
Tarsus	20.2–20.7 (20.5; 0.25; 3)	18.6–20.4 (19.8; 0.74; 5)
Hind-claw	6.3–6.4 (6.4; 0.06; 3)	5.9–6.4 (6.1; 0.19; 5)
<i>M. a. vidua</i> (adult and first-year) Egypt, Sudan and Ethiopia (Cramp 1988)		
	Male	Female
Wing	93.0–102.0 (96.4; 3.07; 10)	88.0–96.0 (91.3; 2.39; 11)
Tail	86.0–92.0 (90.0; 3.52; 10)	83.0–93.0 (87.1; 3.50; 11)
Bill	17.6–19.1 (18.3; 0.48; 10)	16.9–18.5 (17.9; 0.75; 11)
Tarsus	23.9–26.4 (25.2; 0.90; 9)	23.2–25.6 (24.2; 0.94; 11)
<i>M. a. vidua</i> (adult and first-year) Kenya and Uganda (Alström <i>et al.</i> in press)		
	Male	Female
Wing	86–101 (93.0; 3.64; 43)	84–92 (88.8; 2.08; 29)
<i>M. a. aguimp</i> (adult) South Africa (Alström <i>et al.</i> in press)		
	Male	Female
Wing	93.0–99.0 (95.9; 2.41; 7)	86.0–89.0 (87.5; 1.29; 4)

Two female specimens (NRM 20016100 and BMNH 2001.8.4) are taken as first-adult, because, compared with other specimens, they have browner and more-worn remiges, primary coverts and alula, and slightly differently shaped and textured primary coverts (Plate 2). These features are universally useful for ageing in Eurasian Motacillidae (Alström *et al.* in press). Moreover, they show less white on these feathers than the presumed adults, as is the case also in *M. aguimp* (remiges only), *M. grandis* and *M. alba lugens* (Alström *et al.* in press). All the male specimens are similar to the adult females in these respects, and are therefore considered to be adult. Since we have not seen any definite first-adult males, we do not know whether or not they differ from adult males in the wing pattern.

Moult

This species either lacks or has just a very limited pre-breeding moult, as in *M. maderaspatensis* and *M. grandis*, but unlike *M. aguimp* (at least *vidua*) and all subspecies of *M. alba* (Alström *et al.* in press). All the specimens are worn. Males have either no or just a few scattered newer feathers, on the forehead, crown (mainly sides) and nape. The females have a few scattered newer feathers on the forehead, especially, crown (mainly sides), nape, mantle and scapulars. In addition, NRM 20016100 has new R1–R2 (right R2 still growing) and right S1 and S6, and the carpal

covert in the right wing appears newer than the greater coverts (Plate 2). All birds studied closely in the field showed overall worn plumage, without any fresh secondary coverts or tertials (except for two females, one adult and one first-adult based on the appearance of the secondaries, which had the longest tertial in one wing new).

The two first-adults do not differ from adults in pattern and/or degree of wear of any median and greater coverts or tertials (Plate 2). We therefore assume that all of these feathers had been renewed during the post-juvenile moult (as is usually the case in *M. maderaspatensis* and *M. grandis*; in *M. aguimp* and the different taxa in the *M. alba* complex the number of median and greater coverts and tertials replaced during the post-juvenile moult is variable, ranging from none to all; Alström *et al.* in press).

Morphological comparisons with other species

Adult and first-adult

Motacilla samveasnae is easily distinguished from all Eurasian wagtail taxa by head pattern, with blackish or dark greyish lores, ear-coverts and central stripe on forehead (to bill, and including bases of feathers), long, broad white supercilium, and white throat and patch on sides of neck. All taxa in the *M. alba* complex have white forehead, and none has all dark ear-coverts; in addition, all except three taxa have white lores, two taxa have black sides of the neck, and most taxa have black throat in summer plumage. Two aberrant individuals of *M. alba* show dark feathering running down the forehead to the bill: *Motacilla frontata* Swinhoe, BMNH 1898.10.20.436 (which we consider most likely to be an aberrant *M. alba leucopsis*), and *M. alba yarrellii* BMNH registration no. 1965-M-8789. However, both these have white bases to the anterior dark feathers on the midline of the forehead (as is typical in all subspecies of *M. alba*), and moreover the dark area remains broad to its anterior edge, not forming a fine line as in *M. samveasnae*. *M. maderaspatensis* has the forehead, lores, ear-coverts and supercilium patterned as in *M. samveasnae*, but has black throat and sides of neck. *M. grandis* is similar to *M. samveasnae* in the pattern of the lores and ear-coverts, but has mainly white forehead (dark does not reach the bill, except occasionally as a dotted dark line), slightly narrower and shorter supercilium, mostly black throat and black sides of neck. *M. samveasnae* also differs from *M. maderaspatensis*, many *M. grandis* and all taxa in the *M. alba* complex except some *lugens* by the, from above, white bases to the outer and inner webs of the secondaries and inner primaries (visible as a white band on the spread wing; in first-adult female *M. samveasnae*, mainly on the inner primaries). *M. maderaspatensis* can have extensively white inner webs and usually has broad white edges to the outer webs, but never shows all-white bases to the outer webs; in all taxa in the *M. alba* complex except some first-year *lugens*, the white bases to the remiges are so restricted that no white band is created; adult male *M. a. lugens* and *M. grandis* show white primaries with dark tips and all-white or mostly white secondaries, and adult females of these species and first adult males and females of the latter species have white remiges with dark tips to the primaries and variably prominent dark tips to the secondaries.

TABLE 2

Wing formulae of *M. samveasnae* (except BMNH 2001.8.2, which was too worn to measure; P6 unmeasurable on two further birds) and *M. aguimp vidua* (the latter from Alström *et al.* in press). Distances from wing tip (mm). E stands for emargination; number in brackets is the mean.

<i>M. samveasnae</i>					
P4	P5	P6E	P7E	P8E	P9
11.0–16.0(13.7)	6.5–9.0(7.9)	1.0–1.5(1.2)	0	0	1.5–2.5(2.1)
<i>M. a. vidua</i> (7 males, 4 females, adult)					
P4	P5	P6E	P7E	P8E	P9
13.0–19.0(15.2)	6.5–14.0(8.7)	0.5–2.0(1.2)	0–1.0(0.3)	0–1.5(0.1)	1.0–3.0(1.8)

M. samveasnae is very similar to *M. aguimp* but is on average smaller, with proportionately longer bill (Table 1; sexes should be compared separately due to dimorphism in size). Unlike *M. aguimp*, the blackish breast-band of *M. samveasnae* usually reaches onto the lower throat. Accordingly, the white throat patch is generally smaller in *M. samveasnae* than in *M. aguimp*, and the blackish 'spur' that extends from the breast-band to the ear-coverts generally appears broader and more 'continuous' with the breast-band than in *M. aguimp*. Moreover, the upper border to the blackish breast-band is frequently ragged and blotched in *M. samveasnae*, whereas in *M. aguimp* it is usually rather clear-cut. On average, the white patch on the side of the neck is smaller and reaches less high up behind the ear-coverts, and accordingly looks less elongated, in *M. samveasnae* than in *M. aguimp*; however, the appearance of the white patch varies considerably both individually and depending of the posture of the bird. The upperparts average paler in *M. samveasnae* than in *M. aguimp* (comparison controlled for sex, age and plumage wear). Male *M. samveasnae* are generally more similar to adult female 'summer' *M. aguimp*, and we suspect that *M. samveasnae* is never so jet black above as are most adult males and some adult female *M. aguimp* in 'summer' plumage. However, we have only seen *M. samveasnae* in worn plumage. Conversely, adult female 'summer' *M. aguimp* is only rarely so pale above as most female *M. samveasnae* (though in 'winter' plumage, adult female *M. aguimp* can be rather greyish above; Alström *et al.* in press).

The greater coverts show more dark on the outer webs in *M. samveasnae* than in *M. aguimp*, though there is overlap (Fig. 1). Although the greater coverts of *M. samveasnae* frequently appear mostly white in the field, more commonly they show prominent dark centres. In contrast, the greater coverts of *M. aguimp* usually look all or mostly white in the field (though concealed blackish patterns on inner webs often shine through as pale grey shadows; Alström *et al.* in press). In *M. aguimp*, juvenile greater coverts have on average more extensive dark on the outer webs than post-juvenile ones, and are thus more like those of *M. samveasnae* than are adult feathers; at least some juvenile outer greater coverts are frequently retained in first-'winter' and first-'summer' *M. aguimp* (Alström *et al.* in press).

The pattern of the remiges, especially primaries, differs significantly, although rather subtly, between *M. samveasnae* and *M. aguimp* (Fig. 2, Table 3). In *M. samveasnae* the white on the outer webs of P1–P5 extends far towards the tips of the feathers as a progressively narrower white edge (Fig. 2, Table 3); also P6 shows a prominent white outer edge in 5 of the 8 specimens (indistinct in one adult female and both first-adult females), and P7–P9 show very narrow whitish outer edges. In contrast, in *M. aguimp* the white on the outer webs of the primaries only reaches slightly or not at all beyond where the dark portion ends basally (Fig. 2, Table 3). Patterns on inner webs of primaries differ between the species in a similar though less pronounced way (Fig. 2, Table 3).

On P6–P8, *M. samveasnae* shows on average considerably less white on the outer webs basally than *M. aguimp* (Table 4); in *M. samveasnae* the bases to the primaries on the folded wing appear dark with, at the most, small white markings (and very narrow white edges), whereas *M. aguimp* usually shows a rather prominent white patch basally on the primaries on the folded wing (most pronounced in adult male, least so in first-year female; Alström *et al.* in press). P10 (very small and difficult to locate; concealed by primary covert No. 9) is all white or shows a thin dark streak along the centre of the feather in *M. samveasnae*, while it is blackish with a narrow white outer edge and tip in *M. aguimp*.

On S1–S5 (S1–S4 in two birds) the dark portion on the outer web tapers rather gradually towards the base in *M. samveasnae*, while in *M. aguimp* the dark portion on the outer web of the secondaries usually ends rather bluntly at the base (Fig. 2); on S6 (and S5 in two *M. samveasnae*) the pattern is similar in both species. Occasionally, first-year *M. aguimp* resembles *M. samveasnae* in this respect, but no specimen of *M. samveasnae* shows a pattern on S1–S3 reminiscent of typical *M. aguimp*. On the inner webs of the secondaries, the dark portion tapers rather gradually towards the base in *M. samveasnae*, while it ends more abruptly in *M. aguimp*; in *M. samveasnae*, but not in *M. aguimp*, the white on the base of the secondaries sometimes reaches to the feather-tip along the edge (Fig. 2, Table 3).

All specimens of *M. samveasnae* show narrow whitish outer edges *basally* to the primary coverts (perhaps also distally when fresh), whereas *M. aguimp* usually lacks whitish edges to the primary coverts, or shows thin whitish outer edges *distally*. The inner webs of the primary coverts show more prominent white bases in *M. samveasnae* than in *M. aguimp*. In adult *M. samveasnae* the central alula feather shows distinct white tip and edges to the outer and inner webs (widest basally on the inner web). In contrast, in adult *M. aguimp* the white on the central alula feather is often very insignificant and is usually mainly or entirely restricted to the distal portion of the outer web and tip to the inner web (can be lacking on tip of inner web). In first-year birds of both species, the patterns are more similar to each other (having indistinct pale tips and lacking white edges to inner webs), although it seems that *M. samveasnae* may show more distinct outer edge than *M. aguimp* (although the sample of the former is too small for conclusive evaluation).

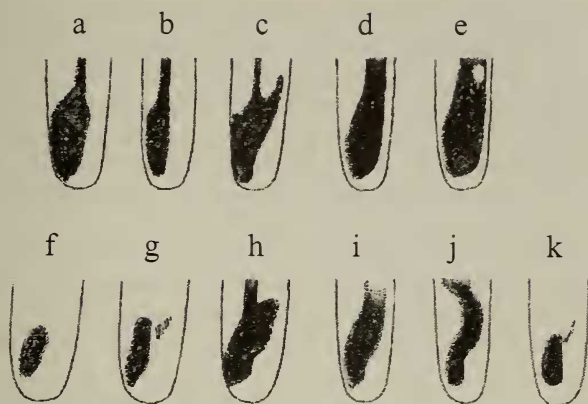


Figure 1. Top row: Right GC1 of *Motacilla aguimp* (a-c) and *M. samveasnae* (d-e). Bottom row: Right GC4 of *M. aguimp* (f-h) and *M. samveasnae* (i-k). For each species, the commonest type is shown to the left and the rarest to the right. Drawing: Per Alström.

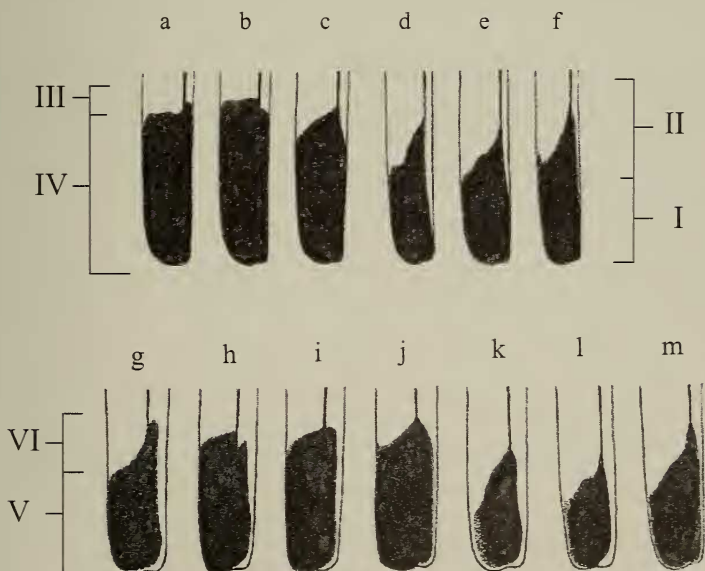


Figure 2. Top row: Right P3 of *Motacilla aguimp* (a-c) and *M. samveasnae* (d-f). Bottom row: Right S3 of *M. aguimp* (g-j) and *M. samveasnae* (k-m). The holotype of *M. samveasnae* is illustrated in d and k; f and m show first-adult female *M. samveasnae* (NRM 20016100); and j has only been seen in first-year *M. aguimp*. Numbers show where the measurements in Table 3 were taken. Drawing: Per Alström.

Both R5 and R6 show a dark edge to the inner webs in our specimens of *M. samveasnae*. In *M. aguimp vidua* R6 is usually all- or nearly all white, and occasionally R5 is all white or shows a much reduced dark edge (25%; n=24); in *M. a. aguimp*, R5–R6 are more similar in pattern to *M. samveasnae*. In *M. samveasnae* R4 is all blackish, while in *M. aguimp* R4 sometimes shows white outer web basally and/or a white tip. In the present specimens of *M. samveasnae*, R1 is entirely blackish, although it is not possible to say whether it had had white edges when fresh. *M. aguimp* frequently shows rather wide white edges to R1 when fresh.

In all except two of the *M. samveasnae* that we observed, the tertials were worn and showed very indistinct pale edges. However, we are unable to say whether fresh tertials have such prominent white edges as in *M. aguimp*.

Juvenile

M. samveasnae most closely resembles juveniles of some *M. alba* subspecies: *alba*, *yarrellii*, *baicalensis* and *subpersonata*. However, it differs from these by showing a dark loreal stripe (at least on proximal part of lores; distal lores can be whitish), darker and more uniform ear-coverts and more prominent supercilium. None of the juvenile *M. samveasnae* observed showed a prominent dark 'brow' over the supercilium that is often shown by juveniles of these *M. alba* subspecies. *M. samveasnae* differs from

TABLE 3

Amount of white on P4 and S3. See Fig. 2 for explanation of I–VI. *M. samveasnae* n=2 adult males, 2 adult females, 2 1st-year females; *M. aguimp aguimp* n=2 1st-year males, 2 1st-year females; *M. aguimp vidua* n=3 adult males, 4 adult females, 3 1st-year males. Numbers refer to range and, in brackets, mean, standard deviation and sample size.

	P4				S3	
	I	II	III	IV	V	VI
<i>M. samveasnae</i>	8–15 (11.2; 2.2; 6)	16–22 (19.8; 2.7; 6)	11–16 (14.2; 1.9; 6)	21–23 (22.0; 0.63; 6)	0–15 (11.7; 5.8; 6)	10–26 (15.2; 5.8; 6)
<i>M. aguimp</i>	21–35 (26.4; 3.3; 14)	3–9 (6.1; 2.0; 14)	4–14 (7.7; 2.8; 13)	26–31 (28.5; 1.56; 13)	22–28 (24.9; 1.6; 13)	2–10 (6.1; 3.0; 13)

TABLE 4

Amount of white visible on the outer web beyond the tip of the longest primary covert (No. 8) on the outer primaries in *M. samveasnae* and *M. aguimp vidua* (measured along the shaft, accordingly excluding narrow white outer edges). Measurements of *M. aguimp* from Alström *et al.* (in press). Numbers refer to range and, in brackets, mean and sample size.

	<i>M. samveasnae</i>			<i>M. aguimp vidua</i>			
	Adult male	Adult female	1st-year female	Adult male	Adult female	1st-year male	1st-year female
P8	0	0	0	0–3.5 (1.4; 7)	0–4 (1.0; 4)	0–4.5 (1.1; 7)	0–2.5 (0.8; 3)
P7	0–2 (1.0; 2)	0	0	0–7 (4.5; 14)	1–6 (3.6; 14)	0–7 (2.6; 21)	0–5 (2.2; 11)
P6	1–3 (2.0; 2)	0–1 (0.5; 2)	0	5–10.5 (8.0; 14)	3–9 (6.2; 14)	1–9 (4.5; 21)	1–7.5 (4.0; 11)

M. alba ocularis and *M. a. lugens* by darker and more uniform ear-coverts and more prominent supercilium, from the latter also by more extensive dark centres to especially the median coverts (mostly white with thin dark shaft-streaks in *lugens*); from *M. a. leucopsis* by overall much darker sides of the head and distinct dark malar stripes (entire sides of head and throat pale in *leucopsis*); and from *M. a. alboides* and *M. a. personata* by dark lores, pale sides of the neck, lack of a pale area below the eye, and dark malar stripes; *personata* and *alboides* often show rather uniformly dark throat. *M. samveasnae* can be distinguished from *M. maderaspatensis* and *M. grandis* by paler throat with dark malar stripes and pale sides of the neck; from the latter also by more prominent supercilium and extensive dark centres to the median and greater coverts (all-white median coverts and largely white greater coverts in *M. grandis*). *M. samveasnae* can be told from *M. aguimp* by the distinct dark malar stripes and more extensively dark centres to the greater and, especially, median coverts (latter mostly white with thin dark shaft-streaks in *M. aguimp*).

Vocalizations

M. samveasnae has two main types of song, a 'simple' song, which is the commonest type, and a 'complex' song, which is given rather sporadically; these two song types grade into each other. Both types of song are probably used in territory defence and mate attraction. Males usually responded more strongly to playback of 'complex' song than to 'simple' song. 'Complex' song was also heard several times when males were agitated, e.g. when Large-billed Crows *Corvus macrorhynchos* flew over the wagtail's territory. It was once heard from a bird that appeared to be a female on plumage.

The 'simple' song consists of short, quick strophes of mostly rather high-pitched, thin, often slightly harsh, notes; the strophes are interspersed by pauses of *c.* 4–6 sec., sometimes longer (Fig. 3, Table 5). Usually, all elements (notes) in a certain strophe differ from each other, and phrases and rattles are rare. The same strophe is often repeated several times (exceptionally, one bird gave the same strophe 11 times in succession, the length of the recording). However, most males appear to have a rather large repertoire of strophes (e.g. 39% unique strophes and another 20% more or less modified strophes, e.g. combinations of strophes, out of 54 strophes in one male; however, most individuals are less variable). The 'simple' song is most similar to the 'simple' song of *M. grandis* (Fig. 3), but usually contains fewer harsh notes

TABLE 5
Measurements of various aspects of 'simple' song of *M. samveasnae*.

Duration of strophes (s)	No. elements/strophe	Bottom frequency (kHz)	Top frequency (kHz)	Frequency range of strophes (kHz)
0.3–1.5 (mean 0.59; 66 str.; 5 inds)	1–12 (mean 5.3; 68 unique el.; 5 inds)	1.8–2.8 (mean 2.31; 66 str.; 5 inds)	6.4–7.9 (mean 7.28; 66 str.; 5 inds)	4.2–6.2 (mean 4.95; 66 str.; 5 inds)

than that species. 'Simple' song of *M. maderaspatensis* (Fig. 3) contains a much higher proportion of drawn-out, harsh, rolling notes than the 'simple' song of *M. samveasnae*, and phrases are common. 'Simple' song of *M. aguimp* differs clearly from 'simple' song of *M. samveasnae* in having more frequent phrases and rattles and usually a fuller, clearer voice. The 'advertising call' of *M. alba* ssp. (which appears to have the same function as 'simple' song in the other black-and-white wagtails; see Alström *et al.* in press) usually consists of a single note that is repeated many times, and is accordingly much simpler than 'simple' song of *M. samveasnae*.

The 'complex' song of *M. samveasnae* (Fig. 4) is a drawn-out (3–18 s in our recordings), rapid ramble of notes, many which are similar to those of 'simple' song, but also includes a high proportion of harsh, frequently markedly drawn-out, notes and drawn-out buzzing sounds; harmonics are common. This type of song may recall the song of Eurasian Siskin *Carduelis spinus* (especially the drawn-out buzzing, wheezing notes). It bears little resemblance to any other wagtail song, but there are some similarities to the 'complex' song of *M. grandis* (Fig. 4), although it is more

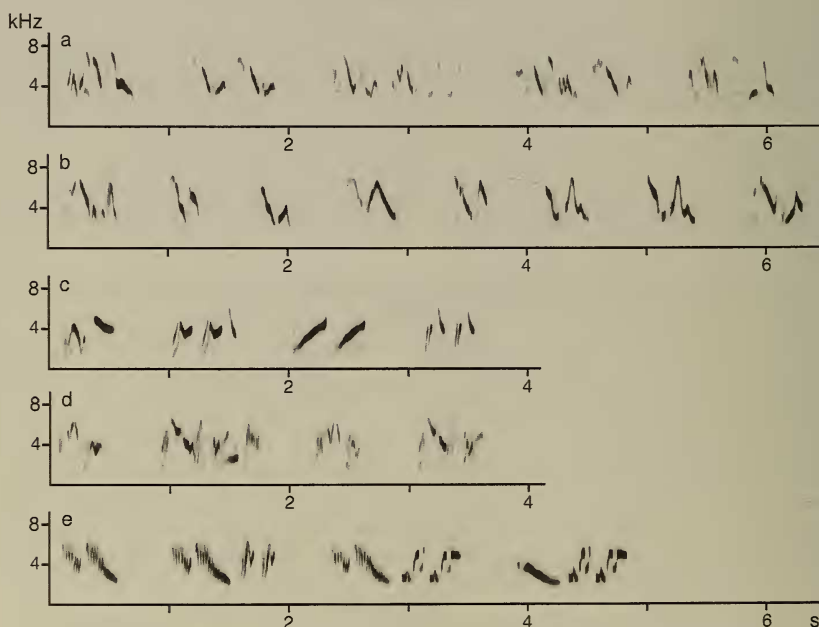


Figure 3. 'Simple songs'. (a, b) *Motacilla samveasnae*. Five and eight, respectively, strophes of two different individuals, Stung Treng Province, Cambodia, mid-February 2001. Tape recordings by Per Alström. (c) *M. aguimp vidua*. Four strophes, Zimbabwe, October. Tape recording by Guy Gibbon. (d) *M. grandis*. Four strophes, Japan. Tape recording by T. Kabaya. (e) *M. maderaspatensis*. Four strophes, Rajasthan, India, April. Tape recording by Per Alström. Sonograms in c, d and e from Alström *et al.* (in press). Pauses between strophes have been artificially shortened in all sonograms.

varied and complex, with more harmonics and fewer phrases. The drawn-out harsh notes gives it some resemblance to the 'complex' song of *M. maderaspatensis* which, however, is quite different, e.g. in being more 'organised' due to a large proportion of phrases. The 'complex' song of *M. aguimp* (Fig. 4) is quite different, having more phrases, fewer harsh notes and harmonics, usually more varied speed, and a generally richer and clearer voice. Excited song of *M. alba* ssp. is somewhat reminiscent of the 'complex' song of *M. samveasnae*, especially in having complex harmonics.

The flight call of *M. samveasnae* (Fig. 5) is a short, sharp, harsh *dzeer*, which is sometimes doubled or, when excited, repeated several times. Slightly softer and lower-pitched versions are also given, both when perched and in flight (when undisturbed). The flight call recalls flight calls of Water Pipit *Anthus spinoletta* and Rock Pipit *Anthus petrosus*. Among wagtails, it is closest to the flight call of *M. grandis* (Fig. 5), but is lower-pitched and less 'clipped'. It is very different from the calls of *M. aguimp* (Fig. 5), *M. maderaspatensis* (Fig. 5) and *M. alba* ssp. Other calls given mainly by

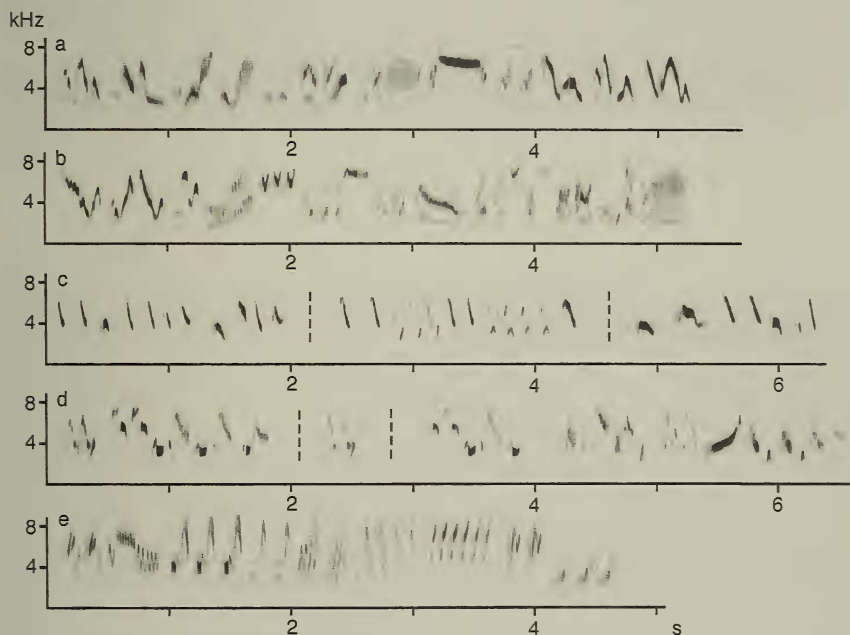


Figure 4. 'Complex' songs. (a, b) *Motacilla samveasnae*. One strophe each from two different individuals (different ones from Fig. 3), Stung Treng Province, Cambodia, mid-February 2001. Tape recordings by Per Alström. (c) *M. aguimp vidua*. Three strophes, Gabon, November. Tape recording by Claude Chappuis. (d) *M. grandis*. Three strophes, Japan. Tape recording by Toshiaki Hirano. (e) *M. maderaspatensis*. One strophe, Rajasthan, India, April. Tape recording by Per Alström. Sonograms in c, d and e from Alström *et al.* (in press). Pauses between strophes have been artificially shortened (marked by dashed lines) in c and d.

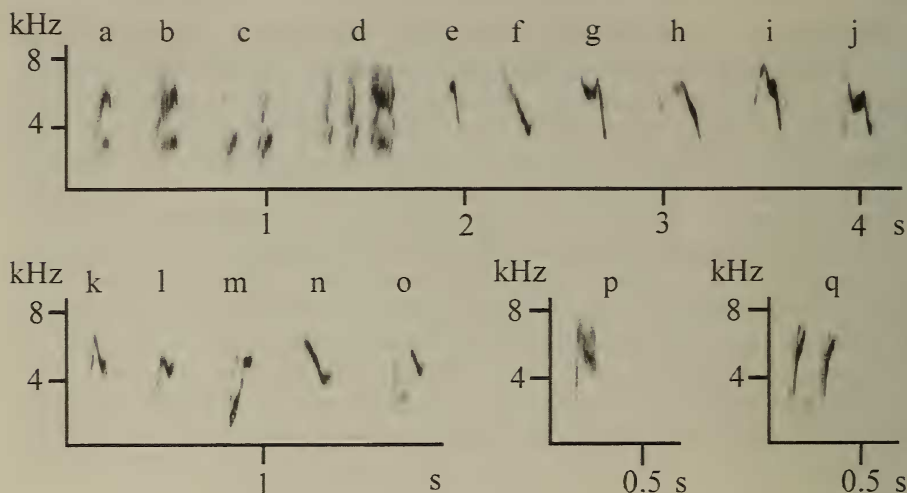


Figure 5. Calls. (a–j) *Motacilla samveasnae*. Flight calls (a–d) and calls from perched birds (e–j). Stung Treng Province, Cambodia, mid-February 2001. Tape recordings by Per Alström. (k–o) *M. aguimp vidua*. At least l and m flight calls, n and o probably from perched bird, Cameroon, December, tape recordings by Claude Chappuis (a, b, d, e); Tanzania, January, tape recordings by Claude Chappuis (c). (p) *M. grandis*. Flight call, Japan, October. Tape recording by Per Alström. (q) *M. maderaspatensis*. Flight call. Rajasthan, India, March. Tape recording by Richard Ranft/ National Sound Archive. Sonograms in k–q from Alström *et al.* (in press).

perched birds are short, thin, soft *tsip*, *tsiup*, *tsiep*, *tseup*, *tsriu*, or similar (Fig. 5); some resemble calls of northwestern subspecies of *Motacilla flava*. We do not have a sufficiently large sample of equivalent calls of other black-and-white wagtails to evaluate similarities and differences.

Systematics

Five of the 10 recognised species of wagtail have mainly grey, black and white plumages: Mountain Wagtail *M. clara*, *M. aguimp*, *M. alba*, *M. maderaspatensis*, and *M. grandis*. Excluding *M. clara*, this group is thought to be monophyletic (Alström *et al.* in press, PA and Anders Ödeen, unpublished). *M. alba* is polytypic, and some of the nine distinct taxa are often treated as separate species (see Alström *et al.* in press for a review). *M. aguimp* has two rather subtly different subspecies, whereas *M. maderaspatensis* and *M. grandis* are monotypic (Vaurie *et al.* 1960, Keith *et al.* 1992, Alström *et al.* in press).

On plumage, *M. samveasnae* and *M. aguimp* resemble each other considerably more than do some taxa generally treated as subspecies of *M. alba*. For this reason, it might seem most appropriate to consider *samveasnae* a subspecies of *M. aguimp* (alternatively to treat the various distinct taxa in the *M. alba* complex as separate species). Under a 'phylogenetic' species concept *sensu* e.g. Cracraft (1989),



Plate 3. Breeding habitat of *Motacilla samveasnae*, Stung Treng Province, Cambodia, mid-February 2001. Photographs: Pete Davidson.

samveasnae is a species, since it is diagnosably different from *M. a. aguimp* and *M. a. vidua*. Under the 'biological' species concept (Mayr 1942), the taxonomic rank of *samveasnae* is debatable, since it is allopatric with *aguimp* and *vidua*. However, unlike the taxa in the *M. alba* complex, which have basically similar songs and calls (Alström *et al.* in press), the songs and calls of *samveasnae* and *vidua* (we lack information on *aguimp*) are very different. Moreover, according to mitochondrial DNA data (PA and Anders Ödeen, unpublished), the difference between *samveasnae* and *M. a. vidua* is greater than between *samveasnae* and any of the other black-and-white wagtail taxa; larger than between, e.g., *M. grandis* and *M. maderaspatensis*, or between these two and any of the taxa in the *M. alba* complex; and much greater than between any of the taxa in the *M. alba* complex. Actually, the molecular data suggest that *M. samveasnae* shares a more recent common ancestor with *M. grandis*, *M. maderaspatensis* and the *M. alba* complex than with *M. aguimp* (which is the most basal taxon). These facts, together with the widely disjunct distributions of *samveasnae* and *M. aguimp*, argue for the treatment of *samveasnae* as a species separate from *M. aguimp*. The differences in moult and habitat choice between *M. samveasnae* and *M. aguimp* further add to the distinctness of the former taxon.

Habitat

Almost all records of *M. samveasnae* come from the breeding season. All are from within or close to a specific form of river channel habitat, referred to as 'channel mosaic' by Duckworth *et al.* (in press) (Plate 3). Flow in the Mekong is strongly seasonal, reflecting the marked dry–wet season climatic regime (e.g. at Kratie, maximum discharges are approximately 54 times minimum discharges; UNECAFE 1966). In the low-flow season (roughly November–May), a typical mosaic stretch is in a broad, lowland river, the stream-bed exposed to provide rocky outcrops and bushland, often with gravel shoals and/or sand bars, tufted grasses and annual dicotyledons. Fast-flowing streamlets cross the sediment and rock bars. The bushes suffer prolonged annual submersion, and at least some species seem not to grow on the adjacent floodplain. *Homonoia riparia* Lour. (Euphorbiaceae) dominates, with *Pittosporum* sp. (Pittosporaceae; particularly on deep sand), *Syzygium ripicola* (Craib) Merr. & L. M. Perry (Myrtaceae; infrequent), *Combretum trifoliatum* Vent. (Combretaceae; infrequent), *Telecladium edule* Baill. (Asclepiadaceae; especially on rocks) and others admixed. Breeding *M. samveasnae* is strongly associated with swift-flowing braided sections with many rocks and bushes. In 2001, birds were frequently observed where bushes stuck out of the water, but no land was exposed; this presumably reflected atypically high water levels in that year. In the extensive sections of flooded forest along the Mekong, *M. samveasnae* was not found among the trees, but was, as usual, amid bushes and rocks. Sandbar-dominated stretches of channel mosaic may support resident *M. samveasnae*: one extensive sandbar with only one rock-bar, outcropping intermittently, and supporting only a few bushes, formed a pair's territory. This pair fed frequently on the sand surface, but most pairs had little or no

unconsolidated sediment in their territories. Breeding birds only rarely use the earthen banks at the channel margins or those higher islands with vegetation resembling that of the floodplain. Most records come from wide rivers (>100 m across); the minimum width for the species is unknown. All known localities lie below 110 m a.s.l. The only record outside a channel is of two at a pool, within 200 m of a river (Nong Puler; Appendix 2). Many river surveys (notably Timmins & Men Soriyun 1998) checked floodplain pools extensively in areas where *M. samveasnae* occurs, but did not record it. The habitat choice and highly specific breeding habitat is unique among Eurasian wagtails, while *M. aguimp* shows much wider habitat use (see Keith *et al.* 1992).

During high-flow season, channel mosaic is submerged, to greatest depth in August–September. Some tributaries sometimes fill by early May; some channels remain high well into October, possibly even December, in some years. Observations of riverine birds in Indochina have strongly focussed upon December–May, and river channel specialists' high-flow season location is poorly known. The sole high-flow season record of *M. samveasnae* comes from a breeding area, and was of a bird perched on bush-tops protruding above the floodwaters (Appendix 2).

Breeding and behaviour

Like other South-east Asian river-channel passerines, *M. samveasnae* breeds in the latter part of the low-flow season. Observed breeding behaviour includes singing, sexual chasing and the carrying of nest material in mid-February (2000 and 2001), food-carrying to nestlings, and (separately) a juvenile on 23 April (2000), to juveniles in mid-April (2001) and in mid- and late May (1997 and, many, 1998). Two females collected (BMNH 2001.8.2 and 2001.8.3) had developing brood patches, well advanced in the former, which had a well-developed egg in its oviduct (Anders Hansson, pers. comm.). Breeding must cease by May or June, when water levels rise rapidly. In mid-February 2001, apparently just prior to egg-laying, most birds were in pairs (only one bird believed to be single was seen), and usually remained together also when approaching the speaker in response to playback of song. Sometimes neighbouring males were apparently counter-singing, but territorial exclusion seemed rather weak. On several occasions, a bird was observed to display momentarily to another individual by pointing its bill upwards, highlighting the conspicuous throat/breast pattern. This display appeared to be a sign of dominance.

Males usually sang from atop a bush or boulder, less commonly from flat ground. Unlike other wagtails, *M. samveasnae* fed regularly within emergent bushes, walking along branches and picking small food items from these or from the leaves. Bushes were also used as shaded loafing places.

In several observations of *M. samveasnae* and *M. a. leucopsis* feeding in the same general area, sometimes only feet from each other, no interaction was observed. If flushed, the two tended to depart independently.

Known distribution

In the breeding season, birds occupy a substantial length of the Cambodian Mekong upstream from Kampi (the downstream extent of channel mosaic habitat) into southern Laos. The upstream limit remains unclear. Lengthy stretches (apparently, wherever channel mosaic habitat occurs) of the Mekong tributaries the Kong (Cambodia and Laos), San (Cambodia) and Srepok (Cambodia) rivers are also occupied. In optimal habitat, linear densities reach many pairs per kilometer. The one wet-season record so far concerns a bird in a breeding area; the Thai specimens are also from the non-breeding season but lack precise site data. Similar habitat searched in north and central Laos was devoid of *M. samveasnae*, as were rivers or stretches in the range of the species, but lacking channel mosaic habitat. Sites are plotted on Fig. 6 and precise locations are given in Appendix 2. Birds apparently *M. samveasnae* (but lacking the white neck patch) are illustrated, as *M. a. alboides*, in two field guides for China (Viney *et al.* 1994, MacKinnon & Phillips 2000); this presumably reflects secondary use of Lekagul & Round's (1991) illustration, rather than Chinese records of the taxon.

Conservation

Numbers of *M. samveasnae* are certainly healthy in Cambodia; they cannot yet be assessed in Laos. While many other river channel birds are under intense regional threat (Lekagul & Round 1991, Duckworth 1996, Duckworth *et al.* 1998b, 1999, in press, Evans *et al.* 2000, Evans in press), the mosaic areas upon which the wagtail depends are less vulnerable to most human-induced changes than are purely sedimentary features (which can be washed or excavated away), the species is too small to be hunted specifically, and territories right next to towns, e.g. Stung Treng, indicate a high tolerance of human presence. Large dams, notably for hydroelectric power, are the most likely threat, because they may involve trans-basin diversions and/or big storage head-ponds, where water is collected during the wet season and released during the dry. Dams on low-gradient rivers, which flood the channel (including the species' only breeding habitats) a substantial way upstream are probably, given the habitat within its range, the main threat to the wagtail; many such projects are proposed for the Mekong.

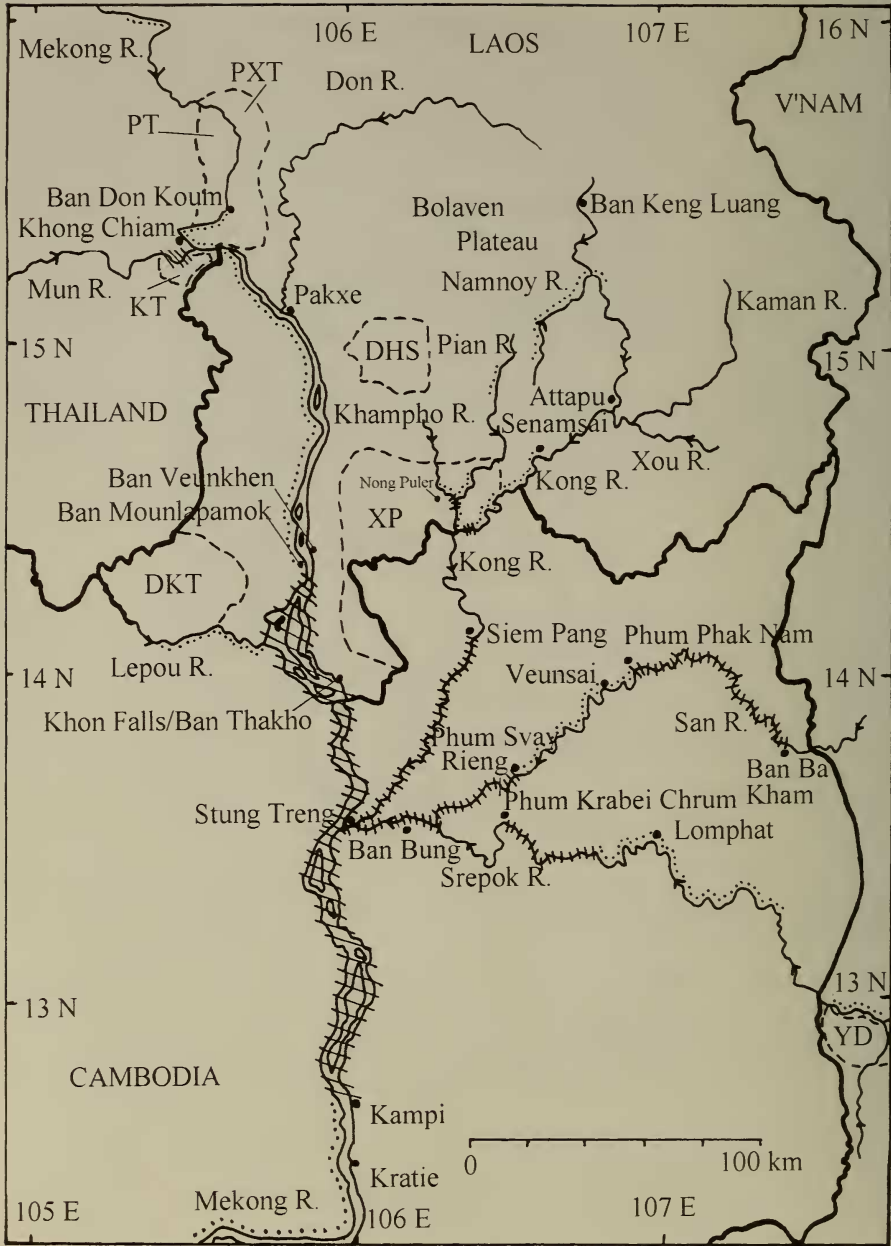
M. samveasnae occurs in several protected areas: Xe Pian and (provisionally) Phou Xiang Thong National Biodiversity Conservation Areas (NBCA) in Laos, Lomphat Wildlife Sanctuary in Cambodia, and potentially Pha Taem and perhaps Kaeng Tana National Parks in Thailand. However, little channel mosaic habitat is within, rather than abutting, protected areas and, moreover, because water flow characteristics depend upon distant upstream activities, protected areas cannot directly ensure the species' survival. The species occurs mainly in Laos and Cambodia, but events in Thailand, Vietnam and China also influence stream flow. Active conservation measures for this species, as for the entire riverine biodiversity (itself in



Figure 6. Known distribution of *Motacilla samveasnae*, (a) Indochina, showing surveyed areas; (b) enlargement of occupied area.

Bold line, national boundary, except where formed by a marked river
Arrowed line, river mentioned in text, with direction of flow
Hatched river stretch, confirmed records of *M. samveasnae*
Dotted river stretch, at least moderately well surveyed with no records of *M. samveasnae*
Dashed line, boundary of protected or proposed protected area

- DHS Dong Hua Sao National Biodiversity Conservation Area
- DKT Dong Khanthung proposed National Biodiversity Conservation Area
- KT Kaeng Tana National Park
- PXT Phou Xiang Thong National Biodiversity Conservation Area
- PT Pha Taem National Park
- R river
- XP Xe Pian National Biodiversity Conservation Area
- YD Yok Don National Park



(b)

crisis; Dudgeon 2000), will centre on holistic review and modification of proposals for large dams, and will necessitate international cooperation.

M. samveasnae occupies a very small total area, because of the linear nature of its habitat. This makes it permanently susceptible to extinction. Localised high densities in optimal habitat may be separated from other such stretches by long reaches of unsuitable habitat. Under IUCN (1994) red list criteria for threatened species, the bird may best be considered 'near-threatened' under C2b and/or B1+B2c. At present, the only need for active conservation attention is in the highly complex, politicised, area of dam development, and one major project in a key stretch of river could necessitate modifying status to Vulnerable. This urges for regular review of the status of *M. samveasnae*, and specific consideration of it in environmental assessment work for any dam within its range.

Information needs

For a newly described taxon, *M. samveasnae* is already relatively well known. Because no obvious current threats are identified, it is not a high conservation research priority. This assessment could change quickly, if certain dams are built. The following information, with particular attention to upstream limits, would help assess the likely effects of such schemes:

1. Location, habitat use and conservation issues of birds during high flow season (June–October).
2. Status in Vietnam, e.g. the Srepok river and its tributaries the Ya Hleo and the Ya Lop, and the San river; also the Da Rang drainage and potentially others in this region, which flow into the South China Sea.
3. Status on the Mekong and larger tributaries (Don, Banghiang, Bang-Nouan and Bangfai rivers) from Pakxe upstream to Vientiane, during the breeding season (February–May).
4. Current status around Ban Dan Kao, Thailand.
5. Status on the Kong river and larger tributaries (Kaman and Xou rivers) in south Laos.

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APPENDIX 1

List of specimens in type series. Holotype in bold. BMNH is the Natural History Museum, Tring, UK; AMNH the American Museum of Natural History, New York, USA; and NRM the Swedish Museum of Natural History, Stockholm, Sweden.

¹Tissue samples of all specimens will be deposited in the BMNH, AMNH, NRM and the Zoological Museum, University of Copenhagen, Denmark. ²Some field photographs (including video grabs) will be deposited in the BMNH. ³All tape recordings will be deposited at the British Library, National Sound Archive, London, UK.

Museum Reg. no.	Location	Date	Sex	Age	Skin	Tissue ¹	Skeleton	Gizzard	Photographs ²	Tape recordings ³
BMNH A/2001.6.1	13°31'56"N, 105°59'15"E	13 February 2001	F	Ad.	x	x	x	x	x	—
BMNH 2001.8.1	13°32'28"N, 106°04'12"E	13 February 2001	M	Ad.	x	x	x	x	x	x
BMNH 2001.8.3	13°31'47"N, 105°58'25"E	14 February 2001	F	Ad.	x	x	x	x	x	—
BMNH 2001.8.2	13°38'56"N, 106°02'26"E	14 February 2001	F	Ad.	x	x	x	x	x	—
NRM 20016100	13°32'8"N, 105°57'37"E	16 February 2001	F	1st-ad.	x	x	x	x	x	—
BMNH 2001.8.4	13°32'8"N, 105°57'37"E	16 February 2001	F	1st-ad.	x	x	x	x	x	—
BMNH 2001.8.5	13°32'8"N, 105°57'37"E	16 February 2001	M	Ad.	x	x	x	x	x	x
AMNH skin 833352	13°35'50"N, 106°05'32"E	12 February 2001	M	Ad.	x	x	x	x	x	—

APPENDIX 2

Site records and gazetteer

Previous identifications by the authors and colleagues of '*M. a. alboides*' using Lekagul & Round (1991) are taken as *M. samveasnae*. Some such identifications have field descriptions and/or sketches confirming *M. samveasnae*. Past records of '*M. alba*', subspecies not given, where habitat, season and/or locality suggest that *M. samveasnae* might occur, are listed, explicitly as indeterminate. Those previously published as *M. alba* (here indicated as '*M. alba*') should be modified to *M. alba*/*M. samveasnae*. On current distributional knowledge, *M. samveasnae* need not be invoked for the many other published '*M. alba*' from Laos during the 1990s. Records not credited to source are those previously unpublished of the authors.

Breeding season records

Streams with records of *M. samveasnae*: Mekong mainstream (Cambodia): Lao border – Stung Treng, 7 June 1998; Lao border – Kampi, February 1999 and February 2000, locally common. Kampi, 10 February 1999, two; 23 April 2000, a few; 14–15 April 2001, several pairs with fledglings. Kong river inflow – 13°32'08"N, 105°57'37"E, February 2001, locally common. Downstream of Kampi, no *M. samveasnae* were seen as far as Komphong Cham in February and April 2000, nor has any been seen in numerous observations around Phnom Penh. These areas lack channel mosaic habitat. (Laos): Phou Xiang Thong NBCA – Khon falls, spring 1996, '*M. alba*' present patchily, (Evans *et al.* 2000), in fact at least some *M. samveasnae*, singles, Ban Donkum, 12 March 1996, (identification provisional; R. M. Thewlis *in litt.* 2001) and Ban Mounlapamok – Lepou river-mouth, 28 April, and 'probably common', Phou Xiang Thong NBCA, in the extensive channel mosaic habitat (R. M. Thewlis *in litt.* 2001); no black-and-white wagtails, Phou Xiang Thong NBCA – Ban Veunkhen, late April. Ban Thakho, 4–6 February 1993, 1–2 (see Thewlis *et al.* 1996). Khon falls, 4 April 1993, 1+ (see Thewlis *et al.* 1996), 26–27 May 1997, juveniles (not confirmed to species), and, 19 February 1999, a pair (K. Komolpalin *in litt.* 2001). Ban To More, Wat Kuck Meung (Champasak Province), 19 February 1999, one (K. Komolpalin *in litt.* 2001). The upstream limit is unclear; the provisional record from Phou Xiang Thong NBCA is significantly upstream any certain record. Superficially suitable mosaic occurs patchily at least to the far north of Laos. Evans (in press) recorded '*M. alba*' south of Savannakhet, in breeding season 1997; but birds on sandbars were *M. alba*, while no wagtails were found in mosaic habitat. P. D. Round (*in litt.* 2000) did not record *M. samveasnae* in spot checks of the Mekong channel between Chiang Khan and Khong Chiam, but there has been very little other searching on the Thai/Lao Mekong upstream of Phou Xiang Thong NBCA. *M. samveasnae* was probably absent from extensive channel mosaic around Paksang, Sangthong District, Vientiane, in 1996, where '*M. alba*' was seen in February, March and July, but not June; no notes were taken on form, but channel mosaic was covered carefully, especially in June (Duckworth 1996, 1997). Extensive observations around Vientiane / Ban Thadua, 1992–2000, recorded no *M. samveasnae*, but it was not specifically checked for. *M. samveasnae* was searched for, and not found, on the Mekong between Louangphabang and Ban Xiangkhok (Louang-Namtha Province) in April 2000 (Duckworth *et al.* in press); it probably does not occur. **Kong** (Cambodia): Stung Treng – Siem Pang, February 2000, common. Stung Treng – a few km upstream of San / Kong confluence, February 2001, less abundant than in 2000; water levels much higher. (Laos): A few km upstream of the Pian river mouth, 5–6 May 1995, up to 3 (see Duckworth *et al.* 1998a). Pian mouth – Senamsai, 13 March 1993, '*M. alba*' common (Thewlis *et al.* 1996, R. M. Thewlis *in litt.* 2001); habitat suitable for *M. samveasnae*. Near Ban Kengluang, December 1997, four '*M. alba*' (Showler *et al.* 1998); habitat seems suitable for *M. samveasnae*. **Pian** (Laos): Khampho / Pian confluence, 1 March 1993, two. A few hundred meters up the Khampho, 2 March 1993, one. Nong Puler (a floodplain pool), 4 March 1993, two (all records see Thewlis *et al.* 1996). Khampho inflow – Pian mouth, 13 March 1993, '*M. alba*' common (Thewlis *et al.* 1996, R. M. Thewlis *in litt.* 2001). **San** (Cambodia): Veunsai – Phum Ba Kham (17 km of the Vietnamese border), 11–17 May 1998; common, including many juveniles. Veunsai – 13°41'N, 106°28'E, February 2000; San / Kong confluence – San / Srepok confluence, February 1999 and February 2000; San / Kong confluence – Ban Bung, February 2001, locally abundant. Channel mosaic along the San is distributed patchily, and so, therefore, is *M. samveasnae*. Between the San–Kong confluence and Phum Svay Rieng are many sizeable patches of channel mosaic, mostly with wagtails. From Phum Rieng to Phum Phak Nam, the San is wide, relatively slow, and dominated by sandbars; channel mosaic is very restricted, and no wagtails were found. Upstream of Phum Phak Nam, patches of channel mosaic occur more frequently, especially towards Phum Ba Kham, where they are every few kilometers. **Srepok** (Cambodia): Phum Krabei Chrum – Lomphat, 31 May – 4 June 1998; patchy. Lomphat – Srepok triangle, February 2000, probably not present; some islands and rock bars, but little mosaic habitat, and none extensive. (Vietnam): Srepok around Yok Don National Park, and Ya Hleo tributary, May–June 1997, no black-and-white wagtails at all (Le Xuan Canh *et al.* 1997).

Potential sites (records of '*M. alba*', now indeterminate): *Namnoy river* (Bolaven Plateau – Kong river), spring 1995 (Duckworth *et al.* 1998a); mostly fast and narrow; no extensive mosaic noted. *Lower Xou river*, February 1996, *Pools near Attapu town*, 1 March 1996, small stream in *Dong Hua Sao NBCA*, February 1996 (all Evans *et al.* 2000). *Kaman river*, January 1997; not found in same stretches in late April–May 1997 (see Davidson *et al.* 1997), and little mosaic habitat seen.

Streams lacking records: Kading/Theun river and tributaries (Mekong – Nakai Plateau), much superficially suitable habitat, but no suggestion of breeding wagtails despite copious fieldwork in springs 1994–1997 (Duckworth *et al.* 1998a, 1998b, Evans & Timmins 1998, WCS Lao Program unpublished data). Lepou river, in Dong Khanthung proposed NBCA; no black-and-white wagtails in late April 1996, nor in February / July 1998 (Round 1998); no mosaic, river being sluggish and silty. Other rivers in south and central Laos (see map in Duckworth *et al.* 1998b for coverage), and Cambodia, have not been covered adequately enough for the lack of records to be meaningful.

Non-breeding season records

There is only one field record of *M. samveasnae* (an adult at Khon falls, August 1999) during July – January; river bird survey effort has been very low in the non-breeding season. The TISTR specimens came from December (probably before breeding starts), from Ban Dan Kao (Amphoe Khong Jiam, Ubon Ratchathani Province), which is on a stream flowing via the Mun river to the Mekong. P. D. Round (*in litt.* 2000) found no wagtails in this general area on 27 April 2000. Cunningham (1998) recorded black-and-white wagtails around Khon in all months of 1997 except July and August. '*M. a. alboides*' accounted for some observations, but details of taxa recorded each month are not available (P. Cunningham *in litt.* 2001).

Gazetteer of sites mentioned in the text

For each site is given the site name (spelling follows official government map if site is marked), country (KH=Cambodia, LA=Laos, TH=Thailand), co-ordinates, and river upon which it lies.

Attapu (LA), 14°48'N, 106°50'E, on Kong / Kaman; **Ban Bung (KH)**, 13°34'N, 106°09'E, on San; **Ban Dan Kao (TH)**, 15°20'N, 105°30'E, on small tributary of Mun; **Ban Donkoum (LA)**, 15°24'N, 105°34'E, on Mekong; **Ban Kengluang (LA)**, 15°26'N, 106°44'E, on Kong; **Ban Mounlapamok (LA)**, 14°20'N, 105°52'E, on Mekong; **Ban Thadua (LA)**, 17°53'N, 102°44'E, on Mekong; **Ban Thakho (LA)**, 13°58'N, 105°59'E, on Mekong; **Ban Veunkhen** (known locally as Ban Mounlapamok, LA), 14°22'N, 105°52'E, on Mekong; **Ban Xiangkhok (LA)**, 20°54'N, 100°39'E, on Mekong; **Chiang Khan (TH)**, 17°53'N, 101°38'E, on Mekong; **Kampi (KH)**, 12°36'N, 106°01'E, on Mekong; **Khampho river mouth (LA)**, 14°31'N, 106°21'E, on Pian; **Khon falls (LA)**, 13°57'N, 105°59'E, on Mekong; **Khong Chiam (TH)**, 15°19'N, 105°31'E, on Mun/Mekong; **Komphong Cham (KH)**, 12°00'N, 105°28'E, on Mekong; **Kratie (KH)**, 12°28'N, 106°01'E, on Mekong; **Lepou river mouth (LA/KH)**, 14°05'N, 105°14'E, on Mekong; **Lomphat (KH)**, 13°30'N, 106°59'E, on Srepok; **Louangphabang (LA)**, 19°53'N, 102°08'E, on Mekong; **Nong Puler (LA)**, 14°31'N, 106°19'E, by Pian; **Paksang (LA)**, 18°14'N, 102°08'E, on Mekong; **Pakxe (LA)**, 15°07'N, 105°48'E, on Mekong; **Phnom Penh (KH)**, 11°33'N, 104°55'E, on Mekong; **Phum Ba Kham** (known locally as **Phum Tangsey**, KH), 13°51'N, 107°22'E, on San; **Phum Krabei Chrum (KH)**, 13°34'N, 106°31'E, on Srepok; **Phum Phak Nam (KH)**, 14°00'N, 106°55'E, on San; **Phum Svay Rieng (KH)**, 13°42'N, 106°33'E, on San; **Pian river mouth (LA)**, 14°27'N, 106°20'E, on Mekong; **San/Kong confluence (KH)**, 13°30'N, 106°04'E, on San/Kong; **Savannakhet (LA)**, 16°34'N, 104°45'E, on Mekong; **Senamsai (LA)**, 14°41'N, 106°38'E, on Kong; **Siem Pang (KH)**, 14°07'N, 106°23'E, on Kong; **Stung Treng (KH)**, 13°31'N, 105°58'E, on San/Kong; **Veunsai (KH)**, 13°58'N, 106°48'E, on San; **Vientiane (LA)**, 17°58'N, 102°37'E, on Mekong.